

#### ABSTRACT OF THE DISCLOSURE

A process for producing a self-cross-linking alkyl cellulose derivative, which includes irradiating, with radioactive rays, a mixture of a starting alkyl cellulose derivative (the number of carbon atoms of the alkyl group is 1 through 3, the alkyl group may be substituted by a hydroxyl group or a carboxyl group, and the carboxyl group may form a salt) (100 parts by weight) and water (5-2,000 parts by weight), and thus obtained self-cross-linking alkyl cellulose derivative has an improved biodegradability and excellent water-absorbability.